

The Organic Farmer

The magazine for sustainable agriculture in Kenya

BIOVISION Nr. 43 December 2008

Serve your cows on time

Lack of knowledge on animal breeding is to blame for the poor quality of dairy cattle in the country.

The Organic Farmer

Many farmers lack knowledge when it comes to managing the fertility of their dairy cattle. This ignorance is to blame for irregular calving, low milk production and the poor quality of dairy cattle in most farming areas in the country. In this issue of TOF, we have revisited the issue of animal breeding following enquiries from several farmers.

Too early or too late.

The quality of dairy cattle in the country started deteriorating two decades ago when the government privatised veterinary services following pressure from donors. Since then, the quality of service has considerably gone down. The private service providers do not impart any knowledge to the farmers on important aspects of breeding such as heat detection in a dairy cow.

What usually happens is that the farmer may call the service provider either too early or too late when chances of the animal conceiving are minimal. Lack of records makes it very difficult for the farmer to know when the cow was last served. Therefore he cannot be able to predict when the animal shall next be on



heat. There is another and even worse problem: Without records, private artificial insemination providers may end up serving the daughter of a cow with the same semen that was taken from its father, resulting in inbreeding. In this issue we advise farmers how to detect heat in an animal and show the best time to serve it in order to increase the chances of conception. Page 3

Cow calendar
This chart is a Cow Calendar, it can help farmers to manage the fertility of their dairy cows. With the calendar, a farmer can tell when the cow will next come on heat, when to dry it and also the date of delivery. Those interested in buying this useful calendar can contact
Fuga Enterprises Limited, P.O.Box 653, Uthiru-00605, Nairobi
Tel. 0733 866 191. Price Ksh200

Sukumawiki

No other vegetable reduces better the occurrence of different kinds of cancers. Page 2



Fish farming

If managed well, fish farming can easily improve the income of farmers. Page 4

Fodder

There are several ways to provide your cattle with adequate fodder during the dry season. Page 5



Dear farmers,

The hike in fuel prices in the recent past has demonstrated how greedy local companies can be in their bid to make profits at the expense of the common man. Although fuel prices have gone down by more than half of what it cost two months ago, oil companies are unwilling to reduce pump prices by the same margin, which has in turn raised the cost of goods and services. This is a big burden to consumers and especially the low income earners. Farmers are also hard hit by the increase in the cost of inputs. When they produce food at unimaginable high costs, it is sad to see companies, which operate like cartels, buying such produce at throw-away prices.

Yet this is what is happening when it comes to the marketing of agricultural products. If it is not the middlemen exploiting farmers, it is the millers and food processing companies. Take wheat for example. Although world prices have remained relatively high since last year, local millers still buy the commodity from farmers at very low prices. One wonders why these companies can afford to buy wheat at a price of upto Ksh 4000 in the international market but pay local farmers as low as Ksh 2400 for a 90 kg bag of wheat. The companies are quick to increase the price of wheat flour and bread to maintain and maximize their profits, but they are not ready to pass on the benefits to the farmers. One of the responsibilities of the National Cereals and Produce Board (NCPB) is to help regulate the price of cereals and store strategic food reserves for the country. Two decades ago, the board used to buy wheat from farmers and sell it to millers as is the case with maize. But individuals with vested interest stopped this, leaving the farmers at the mercy of the millers.

Price controls may appear outdated in a liberalised market such as Kenya's, but sometimes it is the only way the government can rein in unscrupulous companies out to fleece farmers. The other alternative is for farmers to form strong associations that can lobby for their interests. Such associations can exert pressure on the companies – and on the government to change its policies on marketing of agricultural produce.

Due to the current food crisis everyone now is talking about revitalising agriculture. We hope this is not just empty talk. Finally, we wish all farmers a merry Christmas and a prosperous new year 2009!

Sukumawiki keeps the doctor away

Sukumawiki is not only a cheap vegetable. It is also one of the healthiest with lots of vitamins.

John Cheburet

Kale, popularly called sukumawiki, is a staple vegetable for most Kenyan households. In recent years, many organisations pushed for the planting of traditional vegetables arguing that these are more nutritious than sukumawiki. But only few people know the numerous benefits of kales. Some people consider this vegetable to be bitter while others treasure it because it is easy to grow and has numerous health benefits.

Rich in nutrients

Sukumawiki does well in a well manured soil and is relatively drought resistant, meaning that it can be easily grown in most homes across the country. It is a member of the brassica family of vegetables that includes cabbage, Brussels sprouts and collards (a cabbage which does not develop a heart). This family of vegetables is high in nutrients that help in fighting and reducing the occurrence of different kinds of cancers. These nutrients help the liver to neutralize substances in the body that may be cancerous.

Kale is rich in plant pigments (fla-



vonoids) called kaempferol. Research in 66,940 women enrolled in the Nurses Health Study between 1984 and 2002 revealed that women whose diets provided the most kaempferol had a 40 percent reduction in risk of ovarian cancer, compared to women eating the least kaempferol-rich foods. In addition to kale, foods richest in kaempferol include non-herbal tea (like green tea), onions, broccoli, leeks and spinach.

Sukumawiki is also good for men. Recent studies show that those eating the most cruciferous vegetables (vegetables of the brassica family) have a much lower risk of prostate, lung and other types of cancer. In a study of over 1,200 men conducted at the Fred Hutchinson Cancer Research Center in Seattle (Canada), those eating 28 servings of vegetables a week had a 35 per cent lower risk of prostate cancer, but those consuming just 3 or more servings of cruciferous vegetables each week had a 44 per cent lower prostate cancer risk.

In addition, sukumawiki is useful in keeping away other ailments. For instance, the vegetable has a nutrient called beta-carotene that helps in good vision. This nutrient reduces the growth of cataracts that lead to gradual loss of sight. Sukumawiki is a good source of the highly valued vitamin C which reduces the likelihood of developing colon cancer. Just one cup of this cooked vegetable supplies 88.8% of the daily value for vitamin C. Sukumawiki is rich in minerals; calcium, potassium, manganese, iron, and potassium. It also contains an insoluble fiber that is associated with protection against heart disease in both men and women.

Select and cook well

Cut the lower leaves of plants for sale or your own domestic consumption.

When leaves are left for too long, they become coarse and bitter. And, when buying sukumawiki ensure that you select deep coloured leaves that have moist hardy stems. Small leaves are usually tender and have a more mild flavour than larger, more mature leaves. Store sukumawiki in a cool place since warm temperatures will cause it to wilt and reduce its flavour. In addition, you can pair kale with other greens, such as collard greens, which have a sweeter flavor to reduce the strong flavor of kale.

Good for the environment

Sukumawiki is good for the environment. It needs between 5-8 minutes to cook well without losing the nutrients it is known for. This means it requires less energy to cook compared to traditional vegetables which have to be boiled before frying. It is ideal for both rural areas where there is high demand for firewood and in urban areas where there is high demand for charcoal.

Food safety

While sukumawiki has numerous health benefits, it is also important to know that a dirty environment is a major factor that affects the safety of the sukumawiki we plant or buy. In major towns, across the country, it is common to find green leafy vegetables planted near sewers.

Dirty water increases the levels of harmful bugs and bacteria that can be found in the vegetable. There is a strong link between diseases such as diarrhoea and food poisoning caused and the consumption of vegetables grown in dirty water laden with germs such as salmonella, E coli and listeria. Farmers planting vegetables in dirty places risk losing customers as people will not buy vegetables with high levels of dangerous bacteria.

The Organic Farmer is an independent magazine for the Kenyan farming community. It promotes organic farming and supports discussions on all aspects of sustainable development. *The Organic Farmer* is published monthly by icipe and distributed free of charge to farmers. The reports in the *The Organic Farmer* do not necessarily reflect the views of icipe.

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Publisher African Insect Science for Food and Health (icipe), P.O. Box 30772, 00100 Nairobi, KENYA, Tel: +254 20 863 2000, icipe@icipe.org, www.icipe.org

Editors Peter Kamau, Peter Baumgartner

Secretariat Lucy W. Macharia

Layout In-A-Vision Systems, 0720419 584

Advisory Board Nguya Maniania, icipe, Charles Kimani, farmer, Wangige, Joseph Mureithi, KARI, Henry Kiara, ILRI, Christian Borgemeister, icipe, Sunday Ekese, icipe

Address *The Organic Farmer*

P.O. Box 14352, 00800 Nairobi, KENYA

Tel: +254 20 445 03 98, 0721 541 590

e-mail: info@organickenya.com,

www.organicfarmermagazine.org



Know the best time to inseminate cows

Many farmers serve their animals when it is too early or too late. Result: Failed conception.

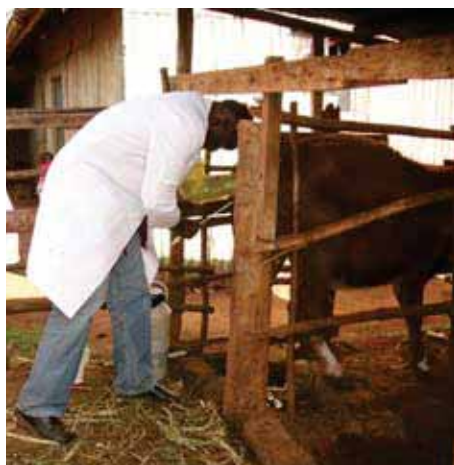
The Organic Farmer

Several Farmers have written to us requesting to know how they can be able to tell when and if their dairy cows are on heat and need to be served. To us this is an important question because good timing in serving a dairy cow will determine the success of conception. Timely service also ensures that a cow's calving cycle is attained. Most farmers serve their dairy cows too early or even too late due to lack of knowledge. Failed conceptions can be avoided if the farmers are well informed on the tell tale signs that a dairy cow shows when she is in need of service.

Cows need attention

The fertility of a dairy cow is very important. It affects the number of calves born and the total milk produced during the entire life of a cow. Good fertility improves a dairy farmer's income. A cow's fertility is determined by the number of calving intervals- this is the period between two successive calvings (births). A healthy cow should give birth after every 365 days, or every year. The calving interval is divided into two periods: The calving-conception period (the period the cow gets pregnant) and the conception-calving time. A dairy farmer, thus, should pay much attention to the cow between calving and conception period. The farmer should ensure that he serves the cow at the right time to increase the chances of the cow conceiving.

The cow should be properly fed with a balanced diet of carbohydrates, proteins and minerals. It is important



Farmers should use semen from known service providers such as CAIS (Central Insemination Services). This helps upgrade the cows, improve their growth, milk production and health.

to point that a poorly fed dairy cow cannot come on heat at the expected time because its body may not be in good condition for conception. Diseases associated with the animal's reproductive system may also interfere with conception.

Short heat period

Very often only a few of the signs (on the right) are clearly visible. For instance, when the weather is warm, the cow will not be very active and there may be a secretion of mucus indicating that the animal is still on heat. At this stage it is too late to serve the animal since this may lead to failed conception. In tropical countries such as Kenya, the period during which the farmer can detect heat in a cow is very short. The visible heat period lasts only for between 11-12 hours for grade cattle. This means that the farmer has to be alert and observe their cows closely to notice any heat signs. Observing the cows in the morning milking and also in the evening can help the farmer to detect heat. A farmer who keeps good records of their animals can also predict when the animal is about to come on heat. This can help them serve the animal at the right time (see page 1).

If the animal bleeds from the vulva two days after the end of the heat period, then it will come on heat in the next 17 – 25 days. Normally a cow will show the first heat within 3-4 weeks after calving. If a farmer kept good records, it is always easy to predict when the animal will come on heat again. The best time to serve a cow is between 45 to 90 days after calving. Any insemination done before 45 days after calving give a lower chance of pregnancy. On the other hand any insemination given in 90 days after calving results in birth intervals of over one year. Therefore it is important that the farmer selects the best time between 45 and 90 days to service their dairy cows.

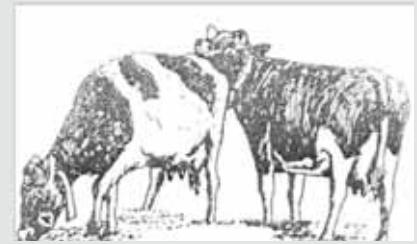
How to reduce inbreeding

- Farmers should always maintain records of each animal.
- When an animal is inseminated, do not throw away the semen straw. All straws are labelled with name and code of the bull from which the semen came from. This helps the inseminator avoid serving the daughter of the cow with semen from the same bull - its father.
- Farmers should avoid use of village bulls to stop the transmission of venereal diseases. Home-bred bulls also increase chances of inbreeding. They should therefore be separated from the rest of the animals at all times.

Signs of an animal on heat

The time during which a cow is on heat can be divided into three phases: The early heat, the standing heat and after heat. During each of these phases, the cow shows specific signs.

Early heat: An animal on early heat tends to sniff other animals. It is also sniffed by the other animals. It tends to mount other animals but walks away



when mounted. The cow is usually restless and keeps on looking around while making noise. Its vulva (lips of vaginal opening) is slightly swollen, moist and reddish. It is also extra attentive. When the animals shows these first signs, the farmer is advised not to inseminate (serve) the cow at this stage.

Standing heat: A cow is said to have standing heat when it shows all the signs already mentioned above. At this stage however, the vulva is swollen, deep red and there is a flow of clear mucus from the vulva (vaginal



opening). It forgets to eat and its milk production goes down. The cow's tail is bent away from the vulva. The animal should be inseminated immediately it shows these signs.

After heat: At this stage the cow continues sniffing the other animals and is also sniffed at. However it refuses to stand when being mounted. A clear



mucus is evident from the vulva. All heat symptoms cool down rather suddenly. Source: *The Fertility of a Dairy Cow (Ministry of Livestock & Fisheries-Development)*

Do you have fodder for the dry season?

Feeding the cattle during the dry season requires good planning – and some additional labour.

The Organic Farmer

Meeting feed requirements for their animals during the dry season is quite challenging for farmers. During the wet season a lot of fodder is wasted in many farms simply because either the farmers do not store the fodder correctly or the modes of feeding adopted are wasteful.

A good number of farmers do not even bother collecting crop residue and storing it in good structures. They just abandon it in the field where it is exposed to wet conditions, consequently rots or becomes unpalatable for animals. Such farmers prefer grazing their animals directly in the field where lots of fodder is trampled upon and thus wasted. Once they have stepped, made droppings or urinated on the fodder, animals cannot feed on it. A good trough or feeding rack is ideal as it ensures that a large percentage of the fodder is consumed.

The feed nutrients

Only if animals are fed more than they need for basic survival, can they then produce more milk or, in case of beef production, gain weight – if all other

management practices are in order. Animal feed should contain various groups of nutrients, and the composition depends on which type of animal is being fed: Proteins help to build the animal's body and its maintenance, carbohydrates provide energy while minerals help in biological regulation and growth. Vitamins regulate biological processes and provide nutrients to the milk. A dairy cow requires plenty of water for milk production, body building and for the regulation of body temperature.

Dry matter intake

The amount of fodder a dairy cow needs depends on its bodyweight. For example a Jersey (400 kg) that produces 15 kg of milk per day will require 11.5 kg of fodder but a Friesian cow (600 kg) needs 16.5 kg/day of dry matter to produce the same amount of milk. This statistics can help farmers to decide what breed of a cow they can buy for milk production.

The amount of feed also depends on the palatability of the feed being offered. Fodder should be cut in small sizes. Nutrition experts advice that fodder for dairy cows should be of the same length as the animal's muzzle (mouth); this is ideal as it allows the animal to chew it into the right quality for ease of digestion. The quality of



A dairy cow needs adequate fodder for optimum milk production. (Photo TOF)

crop residues can be improved by various methods:

- Adding fodder legumes such as lablab or desmodium improves the quality of fodder as well as the supplementation of fodder with concentrates like cotton seed cake or sunflower seed cakes.
- Soaking the hard pieces of crop residues in water increases palability (this softens it).

Continued on page 6

Conserving fodder by use of polythene bags

Take care of surplus fodder. If well stored, it feeds your cow during the dry season and boosts your income. At times we are disappointed to see how careless farmers often handle the surplus fodder. It can be stored as hay (see TOF Nr 19, December 2006) or used for making silage.

There are many methods of making silage, but the use of polythene bags is one of the most suitable for small-scale dairy farmers. The following steps should be taken when making silage using polythene bags.

1. Chop the forage to the correct length using a panga or chaff-cutter. Spread a sheet (Chandarua) or canvas onto a flat surface and place 100 kg of fodder

on it. Spread the material into a thin layer.

2. Dilute 3 Kasuku tins of molasses with 3 litres of water. Sprinkle the diluted molasses onto the chopped forage as evenly as possible. Turn evenly and spread it.

3. Tie one end of 2 metre long polythene bag (1.5 metres, 1000 gauge) to make a large polythene bag. Place the 100 kg of forage already mixed with molasses into the polythene bag and compact as much as possible.

4. Repeat the same process twice, each time compacting the forage thoroughly after adding forage into the polythene bag. Tie the top of the polythene bag tightly ensuring as little air as possible

remains above the forage/ molasses mixture. Place some weight on the tied sack to compact the mixture further. Store the bags away from direct sunlight or rain. The silage will be ready for use after two months. It can then be stored for as long as the farmer wishes.

Cheap solution

Each time you open the silage bag, expel the air from the bag and then tie it tightly to avoid spoilage. Polythene bags cost about Ksh 110 per metre while molasses cost Ksh 300 per 20 litre jerrican. It costs Ksh 385 to make one bag of silage which can feed one dairy cow for upto 4 days. (TOF)



Done correctly, fish farming is profitable

For proper management of fish ponds, farmers should consult fisheries extension officers in their areas.

The Organic Farmer

Despite enormous potential for fish farming in Kenya, there are very few farmers who rear fish. The main reason is that most farmers do not know that fish farming has potential to earn them a living and they also lack the knowledge on how it is done.

Fish farming, like any other economic enterprise, needs good management for it to give good returns. Besides, the fish farmer has to consider many factors before he can rear fish. One of these factors is the market. It is not wise to start any farming activity without carrying out a survey to find out if there is demand for the product you intend to produce. Many farmers have tried fish farming and ended up being frustrated after failing to find market for their fish. Others have failed due to poor management of their fish farms.

Important factors

"It is very unwise for fish farmers to produce fish first, and then look for the market later," Says Mbugua Mwangi, a fish farming expert at the Fisheries Department in Nairobi. Apart from markets, any farmer with an interest in fish farming has to explore the suitability for fish culture in the area they intend to start fish farming. It is wise to consult fisheries extension officers in their districts at every stage of the project. Here are some of the factors potential fish farmers have to consider before making decisions:

Water: Availability of water and its quality is an important factor in fish production. Gravity flow water is cheaper for a fish farmer. Polluted water should not be used for fish farming; farmers should be assisted by extension officers to find out if the quality of the water in their area is suitable for fish farming.

Temperature: Different types of fish

can only survive and reproduce well in different temperatures. In Kenya, tilapia and clarias are the two main species reared by farmers. They do well in warm waters of more than 25°C. For successful tilapia farming, average temperatures of 28°C are best. In areas with temperatures less than this, the farmers are advised to increase the size of the fish pond for the water to acquire the right temperature. Adequate sunlight is required for tilapia farming under semi intensive systems. Others such as trout grow well in cool waters, 10-18°C under free flowing water systems.

Land area: Fish ponds require a larger land area with a gentle slope as compared to fish tanks and raceways. This is more cost effective if the land and water does not cost much. A larger surface area allows for a greater natural production. Pond construction is cheaper than the cost of tanks or fish cages. For tilapia production, one hectare of pond space can produce about 8 to 10 tonnes of fish every year if the pond is fertilised and the fish well fed.



"Fish farming has improved my income"

William Kiama started eating fish as a young man growing up in Mombasa where his parents worked back in 1965. Although he occasionally went for fishing in river Sagana back in his rural home, it never crossed his mind that fish farming can be a good source of income until the Department of fisheries in a project funded by USAID, trained farmers in his area on fish farming, "immediately after the training, I constructed my first fish pond," he says. An immediate increase in demand for food fish from his customers prompted him to increase the number of ponds. He abandoned growing tomatoes, French beans and cabbages and went into full time fish production. "You cannot compare

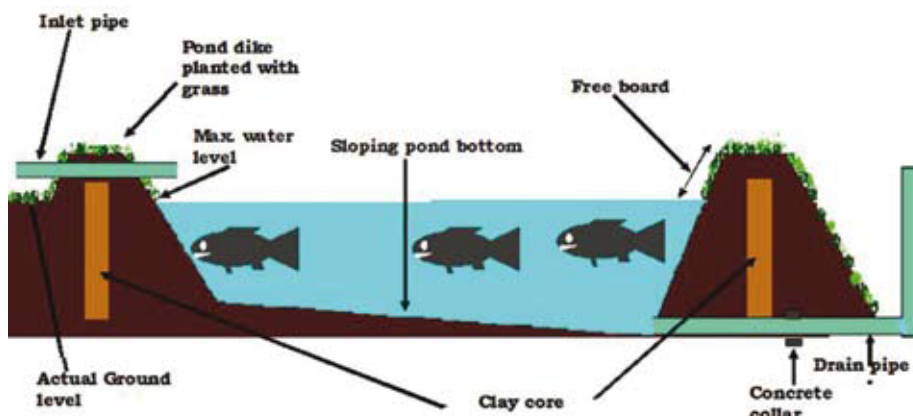
the income from fish farming with crop production. Besides fish farming requires little initial capital and labour apart from pond construction," he says.

Rearing ornamental fish

A few years ago, Kiama diversified his fish farming enterprise and started rearing ornamental fish. The reason he changed is that ornamental fish fetch more money in the market. The 7 ponds on his ¼ acre fish farm are stocked with about 30,000 ornamental fish which is now the main source of his income. The market for ornamental fish is growing in East Africa. This type of fish such as goldfish, olanda and koi carp fetch between Ksh 600 and Ksh 1200 in the local market. He sells the fish to organisations, hotels and individuals with aquariums in Kenya, Tanzania and Uganda.



William Kiama



Through his project, Kiama has acquired enough experience on pond construction; many people including government institutions in the region consult him to train farmers on fish farming and pond construction. He says that any farmer can do fish

Continued on page 6



farmers forum

020 445 03 98 0721 541 590 0738 390 715

>>> from page 4: **Fodder**

• The digestability of crop residues can also be improved by sprinkling it with urea; but this technology is tricky as there is a risk of poisoning the cow if too much urea is used. (Farmers interested in urea-technology can order a leaflet from us).

Proper planning is the key

A farmer should start making fodder for the dry season when there is a lot of green forage material from maize, beans, Napier grass or other crop residue. This is when there is more fodder available than the animals can eat. A wise farmer starts much earlier by taking the following measures:

- Growing grasses and deep rooted legumes that provide high quality fodder for a longer period (leguminous forage contains protein).
- Planting fodder trees such as calliandra, mulberry, Leucaena etc. (see TOF Nr 12, April 2006) which provide farmers with large amounts of high-quality but low-cost fodder.
- Planting sweet potatoes since the sweet potato vines are protein boosters and can survive even during the dry season (see TOF Nr. 31, Dec. 2007).
- Making your own mineral salts by use of plants such as pumpkins, amaranthus etc. (see TOF Nr .41, October 2008).

More on mushroom please

We have found *The Organic Farmer* very educative and useful to us as small-scale farmers strenuously working to realize farming as a business and therefore of benefit to us and our health. We want to contribute more towards making our environment better for ourselves and for generations to come. Your magazine is therefore doing a commendable job. Please highlight more on mushroom growing in your next issue and include us in your mailing list. And we wish you ever-greater heights in promoting agriculture in the country.

Yours truly,
Upendo Growers Self Help Group
upendomushroommolo@yahoo.com

We have already written a comprehensive article on mushroom growing (Read TOF Nr.23, April 2008). You can download the same by visiting our website at www.organicfarmermagazine.org

It is a store of knowledge

We came across your magazines and they are very resourceful to our community-based organizations who indulge in sustainable agriculture. We therefore request you to include us in your mailing list and send to us 20 copies of the magazine for the benefit of our members. I have attached an introductory page and our profile of activities. Thanks for the good work, we really appreciate. Our postal address is ECoS-GROUP, Box 777-20200, Kericho. Tel. 0734523334, Kind Regards, Sylvia Korir, EcoS

More on beekeeping

I came across this magazine two weeks ago and it impressed me a lot due to the information it contains on various aspects of agriculture. I am also very much interested in beekeeping and request for more information regarding the same. I do plant wheat, beans and maize and rear Maasai cattle. Anthony Lemein, P.O Box 52, Olololunga

Dear farmers,
Many farmers have called us in the last one month complaining that they never received their September and October 2008 issues of *The Organic Farmer*. This happened because of some interference with our computerised address list which led to omission of a number of farmers' addresses during preparations for the dispatch of the magazine. We therefore kindly request farmers who did not receive their copies during this period to contact us either through telephone, SMS or e-mail to enable us update our mailing list and resume normal delivery. Immediately we receive your complaints, we will ensure you continue receiving your copy. We regret the error.

Order your CD

The Infonet-Biovision CD contains all the information that a farmer may need. Farmers interested in buying the CD only need to send us airtime worth Ksh 200 through either our Zain line (former CELTEL) 0738 390 715, or through our SAFARICOM line, 0721 541 590. After sending this airtime, please send us an SMS detailing your full name and correct address. We shall send you the CD by registered mail.

>>> from page 5: **Fish farming**



farming if they have adequate water and the right soil profile. An average fish pond of 10 m by 20 m can hold up to 600 tilapia fish. From his 7 fish ponds at the fish farm, Kiama earns between Ksh30, 000 and Ksh 60,000 a month. To reduce costs, he says farm yard manure produces very good fish food compared to use of chemical fertilizer. Natural fish food is also supplemented with maize or rice bran.

The government has recognised his effort. Through the Agricultural Finance Corporation (AFC), they have pledged to advance Kiama a soft loan for the construction of additional ponds and equipment. These will enable him increase fish production. (TOF)

SUBSCRIPTION FORM

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Tissue culture and GMOs

What is the difference between tissue culture and genetically modified crop breeding? Moses Ndung'u PO Box 617, Ol kalou, 0727 902 181

Tissue culture is the growing of parts of a plant or organs in a laboratory environment, free of diseases and or pests (also called *in vitro*). The plants are provided with the necessary nutrients and conditions such as temperature and are light controlled to ensure proper growth. Through this method scientists are able to reproduce or multiply clean planting material of particular crops which would otherwise be very difficult to reproduce in a nursery or other traditional methods without the risk of diseases. Plant material under tissue culture production can be stored for a longer period of time.

GM changes genes

On the other hand, a genetically modified crop is one whose characteristics have been altered by the insertion of a gene or genes from another crop or organism to make it produce more, resist a disease or even a pest. The process is achieved using various techniques of genetic engineering.



A bunch of tissue culture bananas (above).
Tissue culture bananas in a laboratory



New tomato varieties not available

What is the name of the blight resistant tomato varieties and where can one get its seeds?

Two blight resistant tomato varieties have been developed by the World Vegetable Centre (AVRDC) in Taiwan and its regional centre in Arusha Tanzania. These are the Meru and Shengena varieties. However these new varieties are still undergoing field trials before

being released to private seed production companies for multiplication and sale to farmers. Although a few farmers have managed to get the seeds in Taita hills and Usambara mountains in Tanzania, the seeds are meant for trials and not for commercial production. You should wait until these seeds are released into the Kenyan market for commercial production.

Cowpeas are good fodder

At what state are cowpeas best for fodder? Green or dry? Which part of the plant is considered toxic (poisonous)? Can it be used or preserved as hay?

Anthony Muhia, fhoreal@yahoo.com

Cowpeas can be fed to animals when it is still green but it is advisable to dry it slightly in the sun until it has wilted before feeding it to the animals.

Cowpeas are not poisonous. They can be dried and stored as hay like any other fodder. Make sure the fodder is cut into small



pieces! In terms of the right variety for your area, get advice from your local agricultural extension officer.

Home-made feeds

How can we make home-made feeds (dairy, beef, calf, layers, broilers, chicks)? Show us because we want to do it as a business Ramadhan Odhiambo Tel. 0721 908 675.

Although it is possible to prepare home-made rations for dairy cows, beef cattle or even calves (See TOF Nr. 19 December 2006) preparing feed for layers, broilers and chicks requires more specialised equipment which most small-scale farmers may not be able to buy. Exotic chickens such as layers, broilers and even chicks require special feed formulations to grow and produce eggs and the right quality of meat.

A small-scale dairy farmer may not have the expertise and equipment needed to make such feeds. We will send you information material on how to prepare feed for indigenous chickens which you can sell to fellow farmers.

Answers in brief

Weed killer

Can I use 2-4D to weed the just germinated desmodium seedlings?
0721 322 809

The application of chemical weed killers is not recommended in organic farming unless it is absolutely necessary. The use of 2-4D in your case may kill all your desmodium seedlings because the chemical is active on all broad leaf crops. We would recommend that you do the normal weeding to avoid losing your valuable desmodium crop.

Soil tests

I plan to start farming along the shores of river Tana in Mwingi. I have soil samples but I cannot get a place to test them in Eldoret. Please assist. 0727 746 103

Soil tests can be done at the KARI-National Agricultural Laboratories (KARI-NARL) Along Waiyaki way in Nairobi. Contact KARI-NARL P.O.Box 14733, 00800 Tel 020 444 02 29.



Tree tomatoes

How many types of tree tomato are there? Muturi, Kinangop, 0729 015 919 Please assist to get tree tomato seeds and their literature. Pareiyo, Narok 0722 967 314

Tree tomato, also known as Tamarillo (*Cyphomandra b. etaceae*) may have originated from Japan. There are three varieties: yellowish soft, brownish with strips and the pinkish variety with long thick cover.

To get tree tomato seedlings get in touch with Benjamin Lugano Tel. 0733 990 574. *The Organic Farmer* has written about production of tree tomato fruits (TOF Nr. 33, February 2008). If you can send us your full address, we can send you additional material on tree tomato production.

Slurry

Is slurry from a biogas digester classified as organic fertilizer? 0722 339 178

Yes, it has high concentration of nitrogen, potassium and phosphorus which are essential for plant growth in their natural form and can be used as an organic fertilizer.

tips and bits

from farmers for farmers

Mandala: A kitchen garden for the dry season

Getting vegetables during the dry season is a big problem for farmers. This is because most farmers rely on rain to grow their food crops. Come the dry season and many rural households have no reliable source of vegetables as nothing grows at this time. For those farmers without a river frontage (a garden near the river), there are various methods they can use to grow vegetables. One of these is putting up a Mandala garden, named after a farmer in Elitrea who pioneered the first garden of this nature.

Well nourished soil

A Mandala garden is a small circular kitchen garden made close to the house where the farmer can use water from the kitchen to water the garden and grow such vegetables as sukumawiki, spinach, tomatoes, chillies or any other crops that they need. The seed bed is prepared by use of double-digging method to make sure the soil is good enough to retain water and the right texture. With a stick and rope, the farmer can make the outline of

a circular garden in the seedbed. A watering hole is then made at the centre of the circle. A number of furrows and ridges 2 ft apart are then made following the circular outline. A small water channel is then made stretching from the kitchen to the watering hole at the centre of the circle. The garden is first watered and the desired vegetables planted on the ridges, all the waste water from the kitchen flows into the hole where it is used to irrigate the garden. To protect the garden from the animals, the farmer can make a hedge around it or even use a net to protect it against birds.

"Saved my family"

Stanley Mungai is a farmer at Karunga in Gilgil. Two years ago, he learned about the Mandala garden and decided to make one at his homestead. He says



the garden has saved his family of 10 from the severe shortage of vegetables during the dry season which stretches from January to March, " from this garden I have been able to meet the vegetable needs of my family and even sell to my neighbours", He says. Having learnt from him, more than 22 farmers in the area have already made their own Mandala gardens. (TOF)



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